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THE SIGNIFICANCE OF QUALITY.

THE question as to the nature of quality is one of the most important problems of philosophy. It is, first of all, of practical importance, for the difference of quality is the most significant feature of experience and in practical life it is quality not quantity we want.

The existence of quality is a fact. The question is not whether or not quality exists, but what it is and how it has to be explained. Quantity may be very important, but quality is more important, and all of us have to learn how we have to deal with it in actual life.

Quality may be (and we believe it actually is) different from quantity by being unstable and contingent upon conditions, while quantity (in so far as it is equivalent for mass) is constant and indestructible, but for that reason no one can deny either its actuality or its paramount significance. Every trader knows that good quality commands a higher price than bad quality, and quantity is only appreciated if the commodities are of equal quality.

Qualities withdraw themselves from our direct observation. They seem to be occult entities that reside within things. Moreover, qualities change. Some goods deteriorate in course of time, and on the other hand better qualities can be produced from poorer materials by human labor, be it through chemical combinations, mechanical mixture, or other manufacturing processes.

There was a time in the development of mankind in which different qualities were attributed to different agencies that had mysteriously taken possession of things; spirits were supposed to enter or to leave bodies; diseases were explained by obsession and so exorcism was the natural method of the medical art. With the

progress of science and the deeper insight into the mechanical nature of things the animistic conception changed into the metaphysical and the metaphysical into that of positivism. Scientists learned to appreciate the methods of weighing and measuring and they noticed that many differences in qualities could be explained by a difference of proportion. Thus they fondly imagined that they could discard quality altogether and have it subsumed under the category of quantity. No doubt this was possible (at least in a certain sense) in some cases where differences of mixture produce different effects, and, since quality is discredited as mystical, the assertion is made that quality is an illusion and that the old philosophers, among them Aristotle and Kant, had simply blundered by admitting the idea of quality among the categories.

In this sense M. Gros has written his essay on quality and quantity, and he proposes to explain the transition of our philosophical conceptions from quality to quantity. Modern science, he thinks, has disposed of the idea of quality and supplanted it, at least in theory, by methods of counting; but such is not the case, for in spite of the proclamation of the demise of Quality, quality will forever remain the most significant fact of experience, which, if it were merely for practical purposes, can not be dismissed and will have to be retained. A closer inspection will show that the existence of quality is not limited to practical life; it is not a mere illusion of merchants and grocers which disappears in the light of science. For theoretical purposes also the categories of quality will have to be retained as being essentially different from quantity, and this distinction will remain forever indispensable not only to the men of practical life but also to the scientist and to the logician.

Incidentally the statement should be made here that there are some scientists and philosophers who characterize modern science as mechanical and purely materialistic. It is frequently assumed that we should dispose of all former philosophies as antiquated and belonging to the animistic era of savage life. This kind of modern science has proved to be a fond illusion of the rationalist movement which was started in the eighteenth century, for it had to be abandoned on a closer acquaintance with the most important problems

of life. The rationalists of the eighteenth century overlooked entirely the existence of soul. They thought they could explain all processes by mechanical laws, but they forgot that feeling is not a motion and so could not be subsumed under the category of mechanical action. As a result Weber and Fechner introduced the theory of parallelism which showed that feeling is one side of a process which accompanies the physical actions of the nervous system. Thus they fell back on Spinoza who had been the first to teach the duality of existence which in a monistic sense he conceived as one whole, the two sides being sentiency and extension, or idea and matter, or spirit and body. In this contrast quality had been subsumed under the category of the subjective element, sentiency, and quantity under its contrast, the objectivity of extended bodies. Quality began to be suspected on account of its mysterious character. It was denounced as an illusion together with the notions of idea, soul, spirit, etc., and its non-existence was maintained. The absurdity of these theories was obvious, for the theory amounts to a negation of our own spiritual existence, of our thinking, which constitutes the very nature of our most essential being. Thus a reaction has set in and we may say that the modern tendency is no longer to discard the notions of soul, spirit, quality, etc., but to comprehend their nature and significance; to understand what they mean and how they can be explained without resorting to mysticism or a belief in occult phenomena, and this we shall attempt to do now.

Before we give our brief explanation as to the nature of quality we must remind our readers of the monistic principles of science and the philosophy of science. We must be clear as to the nature of the scientific ideas which we use as instruments of thought and we must bear in mind that all general notions are abstractions. The real world is one great totality and the observing thinker describes certain features of it which he symbolizes by a name that applies generally. Abstractions denote real and actual qualities of things but not things-in-themselves. Gravity is not an essence, not an object, but a certain feature which is observed in all things heavy. There is no whiteness in itself, but whiteness is a quality which is

observable in all things which we call "white," which possess such chemical qualities that they reflect the light that shines upon them so as to produce in our eye a chemical reaction which causes the sensation called "white." Sentiency or feeling is a quality which appears in all things sentient. All these general notions and other abstractions are methodically arranged so as to produce different hierarchies in which specific ideas are subsumed under general ideas so as to represent all things, according to rules of logic as genera and species. It is this method of arrangement which makes it possible for us to pigeonhole as it were our knowledge of things systematically and make each notion easily and quickly accessible. It enables us to know the nature of things and to do the right thing at the proper time. In fact, comprehension is nothing but an adequate description of things and a pigeonholing of each correctly under its proper category. Knowledge is a sufficient stock of such descriptions and their orderly arrangement in our minds.

As to the categories quality and quantity, we must observe that there have been things which could be counted and others the nature of which could not be established by counting, but was possessed of features that were describable only in terms referring to special experiences. For instance, we can see how many head of cattle there are in an enclosure, we can tell how many pounds a bag of salt weighs, we can measure how high a tree or house may be, but we cannot by measuring or weighing set forth the taste of salt; we cannot by measuring or weighing explain the nature of a circle. Of course we can measure the size of it, but in order to describe the figure of it we must draw a circle and show it. No amount of counting or weighing will explain its curvature or the relation of the circumference to the center. Thus quality is a thing that stands in contrast to quantity. It cannot be determined by measuring or weighing, but is in need of special experiences, and those who use the same language know exactly what is meant when we speak of the taste of salt, or the taste of sugar, or the color sensations of red, green, blue, etc.

Some sensations have been reduced to a difference in quantity, for instance: rough or smooth may under circumstances be due to

more or less high elevations on the surface. The smoothness of velvet is due to a fine fibre of its fabric which may be of a definitely measurable thickness and height. The rougher plush may be similar in its manufacture, only showing the thread thicker and longer. Thus we may in certain cases reduce quality to quantitative measurements and say that the feeling of roughness or smoothness depends upon certain arrangements that are quantitatively determinable; but this is not true of quality itself, only of some features of quality, and assuredly it is not true of all qualities. Some qualities are due to a difference of configuration. Opaqueness of a piece of coal and the transparency of a diamond are due to an arrangement of their atoms, and we have here a difference of quality which cannot be reduced to a quantitative analysis. It is a difference of quality. The material of which both bodies consist is the same, but the arrangement is different and is due to form.

Difference of form is describable but it cannot be determined by the use of either the yard-stick or the scales. Its nature cannot be defined by either measuring or weighing.

What is true of the qualities of the diamond and the coal is true of all other qualities, spiritual as well as corporeal. Nor is it true that quality is restricted merely to the subjective sphere of existence. Quality plays also a most significant part in the objective world of bodily extension, and indeed the difference of psychological qualities will find its explanation according to the theory of parallelism in the physiological formation of its bodily counterpart. The difference of red sensation and white sensation can be explained by a difference of the nervous state of the retina, and thus an insight into the physical laws of our nervous structure will throw light upon the psychical process of our soul-life.

Intimately connected with the several problems of quality is the idea of unity. In fact the two notions, "quality" and "unity," appear to be inseparable. Every unity is possessed of a quality of its own, and whenever by combination a new unity is created, we are confronted with a quality which originates not as the product of a quantitative summation of its elements, but through a characteristic interaction of parts.

A clock, a steam-engine, a dynamo, etc. are not quantitative amounts of metal, but definite configurations of wheels and other contrivances of machinery which perform a certain kind of work. In addition to the sum total of the weight of all particles a new value is established which is of a qualitative nature; so that in case the machinery breaks down, although there is no loss in quantity, that imponderable something which constitutes the nature and usefulness of the machine, its quality, is gone.

Every chemical combination is a new thing that acts otherwise than did its several constituents.

The qualities of salt (NaCl) cannot be explained as the sum of the qualities of Natrium (Na) and Chlorin (Cl). The taste of salt is contained in neither of its constituents; and so all other qualities of chemicals originate through combination according to the way in which they are grouped.

When we draw three different straight lines in three divergent directions and prolong them until they meet, we produce a triangle; and a triangle is a new geometrical figure with definite angles, possessed of a constitution of its own. The nature of a triangle cannot be deduced from the nature of the several lines; the triangle is a configuration representing a new unity, possessing qualities not contained in its constituent parts.

The combination of parts into a higher unity produces effects which are not a sum of equivalent elements, but introduces a new factor which is of a qualitative nature.

Quantitatively, the universe remains the same, and in every process of nature we can trace the same amount of matter before and after each change. Qualitatively, the universe changes. New qualities originate and old qualities disappear. There is no increase in either matter or energy, but there may very well be an increase of value in quality, or, *vice versa*, a loss. The effort of life is everywhere directed toward a favorable change of quality so as to transform the materials on hand into goods that will give more sustenance of life, greater comfort and better facilities.

And what is the part played by unity in this transformation?

If a number of grains of sand are heaped up in a pile, we have

a mere summation of their several qualities ; nothing but an addition of their weight, mass, etc. But if a number of constituent parts enter into a compound which forms a higher unit we produce something new that did not previously exist. A unitary complex is not merely a summation of its constituent parts ; it contains a new factor which is not of a quantitative but a qualitative nature, originating through the co-operation of its parts ; and this new factor would not have been produced by any of its parts alone, but is the result of their mutual interaction.

The characteristic features thus originated are sometimes most marvelous in their effects and thoughtful observers of natural phenomena, accordingly, have been overwhelmed with awe and wonder. The origin of higher unities with their production of new qualities of most astounding and unheard-of effects, has become the main source of all mysticism ; and, assuredly, the inexhaustible possibilities of new formations are the most fascinating events of life, sometimes as surprising as the tricks of sleight of hand.

Supposing the world to exist of homogeneous material of some kind whirling about in cosmic space, we find it consolidated in the alembic of nebulae into hydrogen, oxygen, nitrogen and other chemical elements, which condense into planetary systems. Every chemical element is not merely the sum total of a certain amount of world-stuff, but a new combination in which, through peculiar groupings of its particles, new units of interaction are created that possess an individuality of their own with qualities that did not exist in the homogeneous ether. Higher complexes are formed in more complicated chemical combinations, and inventors are busy to increase their number by artificial formations. Some chemicals crystallize. According to their angle of juncture they combine with substances of the same kind in different geometrical forms of crystallization. Every crystal forms a new unit, and though its elements are homogeneous in their chemical makeup, yet the crystal as a whole is something new which as such did not exist before.

The most important new departure is attained by organization which produces the phenomena of life. Some of the most unstable chemicals enter into such a co-operation that they form a constant

circuit of materials which by constant renewal of its waste products preserves the original form of the same round of function, and this process is called metabolism. It is a combination of adaptability and permanence; the old form is preserved but constantly modified by new experiences. We call the new product of this wonderful interaction of parts vitality, and there are two forms of it; one, endowed with sentiency, and the other void of it; the former develops into animals, the latter into plants. There is a qualitative difference between the two, and each is differentiated into higher and more complicated forms in the course of evolution.

We see that we can not appreciatively study nature or understand the evolution of life without comprehending the significance of quality. In quality the creativeness of the universe reveals itself, and in contemplating the increasing efficiency of quality, we are confronted with the divinity of nature.

Every unitary complex is an individual, and the tendency is that unitary complexes in their turn will combine into higher unities. The higher unitary complexes in the domain of life are called organisms; their parts which in themselves are smaller units depending on the co-operation of the whole, are called organs. Organs are such intermediary units as could no longer lead a separate individual existence. Thus they are, in a certain sense, true unitary complexes, but are never found separate or isolated.

The highest kind of a unitary complex is man, who as such is called a person. Several persons enter into higher combinations such as states, churches, societies, corporations, etc., and even their interrelations coalesce into organized institutions such as language, habits, laws, forms of government, etc.

Properly speaking, all persons are organs of the social whole; for it will be seen that the combinations of personal interrelations are the most important features of human life. If we could cut out from a person all he owes to society and his social intercourse with his fellow-men, nothing would be left of his personality but the mere physiological organism. Our exchange of ideas, our school institutions, trade, commerce, and even our charities, also the struggle in our social life, competition, trust formations, labor unions, the

antagonism between capital and labor, etc., are due to new combinations in the field of human hopes and ideals. The interrelations of human society are being constantly readjusted, and the result is a difference which is not purely quantitative but qualitative.

The problem of unity found a peculiar construction in India where the unity of the soul was hypostatized into a thing-in-itself called *atman* (or "self") that was assumed to be independent of its parts. The Vedanta affirms, and Buddhism denies, the existence of an atman. Buddha proclaimed as an essential truth of his doctrine that (1) all compounds are transient, (2) that all compounds are subject to suffering and (3) all compounds are lacking an atman, i. e., a self that is independent of its parts. The Vedantic view leads to mysticism while the Buddhist doctrine takes a bold stand upon a sober and purely scientific conception.*

There is no need of entering into further details or pointing out all the applications of the non-existence of the atman, but we must insist on the paramount importance of the part which unity plays. Though a unitary compound, be it in the shape of chemical molecules, or organisms, or inventions of machinery, or mathematical concepts, or ideals, is not a thing-in-itself, though it is not a metaphysical entity which owns its parts as if they were its properties, though there is no atman; yet the effects of a unification are real, and so we say in a certain sense, that things act as if they were ensouled with atmans.

Atmans are conceived in the Vedanta as eternal and immutable, not subject to time and space, and the same can be predicated of the unity of compounds without ascribing to them any mysterious selfhood of atman-existence. Though unifications must be accomplished in time and space, they are possessed of a pre-existence as potentialities in the womb of eternity. They are the Platonic ideas which constitute the formative factor of existence. They are not things-in-themselves but forms-of-themselves. Like pure mathe-

* How difficult the question of unity proves to be can be seen in Plato's attempt at solving the contradictions of "the one and the many." Concerning Kant's theory of things-in-themselves see the author's book *The Surd of Metaphysics*, pp. 6 ff., and 29 ff.

matics, they exist in the domain of potentiality, and their realization, unlike the invention of a fairy tale, has not been woven out of the pure fancy of the inventor. Their realization is, properly speaking, an incarnation or actualization of eternal possibilities. In the same way the invention of machinery, of the wheel, the sewing-machine, the steam-engine, the dynamo, the motor, electric light, etc., are (as indicated by the word) in-ventions, i. e., findings; they are discoveries; in fact they are revelations of hidden truths; they existed as much before their invention as did the continent of America before its discovery either by the Norsemen or by Columbus. They lay concealed in the unfathomable abyss of the laws of being and no one knows what wondrous surprises the future still has in store for us.

Thus we find that the old contrast of quality and quantity is justified. The old philosophers who distinguished these two categories cannot be branded as dupes of an illusion, and we would make a great mistake if we discarded these notions or tried to obliterate the idea of quality. In fact far from rendering our insight into nature clearer it would obscure matters and would involve us in untold contradictions. On the other hand the suspicion which we rightly entertain against notions that lead to mysticism has been disposed of. Quality is by no means an idea which necessarily leads to occultism. A right conception of the nature of quality, which is always due to a definite configuration or structure, constituting a higher unity endowed with new and characteristic features of its own, not contained in any one of its several parts, shows us that there is as little mystery in the differences of qualities as there is in counting, in weighing, and in measuring.

The significance of our solution can hardly be underrated. It throws light upon all problems of philosophy, including the domains of psychology and ethics. It is a solution which commends itself by soberness and justice,—soberness because it disposes of the mysterious aspect of quality without denying the remarkable facts that naturally give rise to mysticism, and justice because we recognize the truth in the statements of both opponents; on the one hand those who insist on the significance of quality as a fact of experience

which is true though it might smack of occultism, and on the other hand those who endeavor to reduce all phenomena of experience to a quantitative analysis in the hope of rendering the universe as intelligible as any system of mechanics.

There is no use denying the wondrousness of the facts of experience after the fashion of the old rationalists, nor is there any need of seeking refuge in agnosticism. The appearance of new qualities necessarily seems a miracle to the uninitiate, and even when we explain these occurrences as the inevitable results of definite combinations of parts into new unities, the fact remains as strange as before. On account of it the universe we live in is replete with illimitable potentialities, a condition which constitutes the main charm of life.

The nature of our own being—the human soul—stands out foremost among all the qualities that challenge the curiosity of the investigator; it is the noblest phenomenon of the universe, and the deepest problem of science. The qualities that appear in the domain of psychology and ethics, constituting the background of religious life and the history of mankind are the most wonderful facts—more wonderful than could be invented by any poet or romancer. We have good reason to assert that all of them are explicable by science, and yet they remain what they are—wonderful, curiously wonderful; apparently miraculous, and certainly divinely grand.

Clearness of comprehension does not destroy the worth of things, and an explanation does not dispose of the facts explained.

EDITOR.